1. Introduction

1.1.Overview:

Theories of human motivation predominantly seek universal explanations for how motivation is developed, strengthened, or undermined. Self-determination theory (SDT: Deci & Ryan, 1987, 2000), for example, presents an understanding of how environments that vary in the extent to which they support three needs - autonomy, competence, and relatedness - produce predictable outcomes in terms of the internalisation of motivation, behavioural engagement, and psychological wellbeing. Specifically, it has been shown that need-support relates to positive outcomes (i.e., internalised motivation, greater behavioural engagement, and more positive wellbeing) and need thwarting to negative outcomes, in a range of contexts including: parenting (e.g., Chirkov & Ryan, 2001), education and teaching (e.g., Yildirim, 2012; Tessier, Sarraxin, & Ntoumanis, 2010), sport and coaching (e.g., Gagné, 2003; Reinboth, Duda, & Ntoumanis, 2004), and within behaviour change programmes (e.g., see Teixiera, Silva, Mata, Palmeira, & Markland, 2012). While work continues to discuss whether the relative importance of specific needs varies by context, and the potential for additional or alternative needs, SDT is clear that both the needs themselves, and the evidenced positive and negative effects of need support and thwarting respectively, are seen as universal.

Recent work, however, has determined that the idea of universal effects is not inconsistent with recognising the important role individual differences play in terms of the *magnitude* of reactions to need support and thwarting. For example, Mabbe, Soenens, Vansteenkiste and Van Leeuwen (2016) argue “although SDT predicts that psychological control is universally harmful, it is less clear about the way maladjustment is expressed” (p.

383). This critique recognises that while SDT's earlier theorising identified a number of 'intertwined' (Deci & Ryan, 2000, p. 251) responses to prolonged need thwarting, it did not rationalise explicitly when, how, and why individuals might display these differentially. This issue is also evident within discussion of SDT's principle of equifinality, that is, that people are persistent in their attempts to satisfy needs, devising new paths when old routes no longer work (Deci & Ryan, 2000). Understanding of how long individuals might persist for, or the varied ways in which they might attempt to 'devise new paths', is limited.

To expand, SDT posits three outcomes of need thwarting, each (ineffectually) aimed at providing some degree of compensatory or protective function. First, developing need substitutes (Deci, 1980) or compensatory motives, second, developing non-optimal regulatory styles, and third, developing rigid behavioural patterns. Recent work (Radel, Pelletier, Sarrazin, & Milyavskaya, 2011) extended understanding by providing more nuanced insight into acute thwarting reactions, identifying a phased reaction similar to Seyle's (1946) stress response. This was characterised by a form of resistance during which cognitive and attentional efforts are directed at attempting to re-establish need satisfaction. Responses to thwarting, then, are able to vary between individuals with respect to both type and duration (before an alternative approach occurs or the individual is exhausted), and also with respect to the observed variation in the magnitude of positive and negative affective responses to the same thwarting or supportive event. To this end, we concur with Mabbe, et al's. (2016) suggestion that the manifestation of responses to thwarting may depend on personality differences. We see no reason not to extend this assertion to encompass reactions to need support also. Explanatory models for *why* and *how* individual differences might moderate effects of need thwarting and support are discussed below.

1.2 Why personality might predict sensitivity to need thwarting and support:

The influence of traits on behaviour and outcomes has been widely discussed within personality psychology in terms of the mechanisms underlying individual differences in differential reactions to different situations (Hampson, 2012; Fleeson & Jayawickreme, 2015). There has, however, been less consideration of why personality results in the differentiated responses. Within SDT, variations in the interpretation of an event or context is referred to as *functional significance* - that is, the psychological meaning attached to events. It is posited that an individual's perception of an event is an active construction influenced by contextual and personal factors that in turn influence their behaviour (Deci & Ryan, 1987). This theorisation is similar to whole trait theory (a synthesis of trait theory and social-cognitive theory; Hampson, 2012), which proposes that social cognitive mechanisms (e.g., information processing; interpreting changing situations and events) might add clarity to the trait explanation of varying behavioural reactions to different situations.

The role of personality in predicting differences in responses to both need thwarting and support can also be rationalised with reference to a number of stress-focused personality theories. In particular, the diathesis-stress model (Zuckerman, 1999), that asserts genetic or biological traits can present as vulnerability for interaction with environmental stressors, creating a predisposition towards negative outcomes on exposure. Belsky's differential susceptibility hypothesis (1997) extends this in a way that is applicable to both satisfaction and thwarting, by suggesting that susceptible individuals not only do worse in unfavourable environments, but better in supportive environments, when compared to less susceptible individuals. This susceptibility has been evidenced in terms of cognitive processing, threat sensitivity, negative attentional bias, and resultant psychopathology (Fox & Beevers, 2016). Related to SDT, this would suggest that some individuals would be more susceptible to noticing and perceiving environmental cues as valenced in some way (i.e., thwarting or supportive), resulting in exacerbated outcomes. Lastly, Deci and Ryan's process of

accommodation following a period of need deprivation, by devaluing the deprived need, has been aligned with desensitization (Moller, Deci, & Elliot, 2010). That is, individuals might have a suppressed response to thwarting if previous negative experiences have resulted in a maladaptive devaluation of the thwarted need.

1.3 How personality might predict sensitivity to need thwarting and support:

Evidence is emerging concerning how specific traits might predict differential effects of exposure to need thwarting or support. For example, an autonomy causality orientation shields individuals from the detrimental influence that rewards exert on intrinsic motivation (Hagger & Chatzisarantis, 2011). Similar effects have been evidenced when assessing personality traits or cognitive styles more broadly. For example, high levels of agreeableness serve as a proactive factor against the adverse effects of controlling parental styles (Jessen-Campbell, Gleeson, Adams, & Malcolm, 2003) and being mindful can buffer the negative effects of a non-autonomy supportive work environment (Schultz, Ryan, Niemiec, Legate, & Williams, 2015). In terms of the mechanisms underpinning these effects, the authors emphasise both perceptual and behavioural processes. Specifically, the interpersonal functioning associated with agreeableness might result in the individual being less likely to perceive a controlling parent as intrusive (perception), and increase the likelihood of that individual using more adaptive coping strategies (behaviour, e.g., more likely to negotiate with the controlling parent; Skinner, Edge, Altman, & Sherwood, 2003). Other work focuses more on the perceptual mechanism; Ryan, Niemiec, Legate, and Williams (2015) suggest for example that a mindful individual might see criticism in a constructive and nonthreatening manner, thus limiting perceptions of competence thwarting, maintaining feelings of relatedness with the “critic”, and feel less controlled in making changes. As outcomes, rather than these specific perceptual and behavioural pathways were assessed, we cannot tell which, if either, dominate.

Dominance of a behavioural pathway would suggest that personality's influence is less perceptual and more reactive, potentially altering both cognition and response behaviours directly. For example, in response to controlling parenting, children low in benevolence and conscientiousness are more likely to externalise their behaviour (aggression, hyperactivity, and delinquency), whilst those low in emotional stability and extraversion are more likely to internalise behaviour (somatic complaints, social withdrawal, and anxiety/depression) in comparison to more resilient children (Van Leevwen, Mervielde, Braet, & Bosmers, 2004). This difference does not rely on personality influencing the degree of need support or thwarting perceived, rather, it operates via altering post-perception attributions and behavioural expression.

In sum, therefore, there is a nascent body of research evidencing that individual differences are related to post-exposure outcomes of need thwarting and, to a lesser extent, supportive environments. This body of work however has yet to clarify *how* personality influences outcomes of exposure to need supportive/thwarting stimuli, and whether perceptual, cognitive, or behavioural mechanisms are dominant in driving these effects.

1.4 Beyond five factors: examining moderating effects of narcissism.

A criticism of existing work exploring how personality moderates outcomes of thwarting and supportive environments is its restricted focus in terms of relevant traits. Whilst the five-factor model is a logical starting point, the time has come to broaden our understanding of other relevant personality traits. One personality trait that warrants further examination with respect to this contextual effect is narcissism (throughout this article narcissism refers to a normal personality trait that differs between people, not the clinical personality disorder).

Two forms of narcissism exist, the most easily recognised form is grandiose (overt) narcissism characterised by a positive, inflated and agentic view of the self, and use of self-

regulatory strategy to main and enhance this positive view. Overt narcissists seek highly competitive situations that provide them opportunities for self enhancement and admiration (Wallace & Baumeister, 2002; Roberts, Callow, Hardy, Woodman, & Thomas, 2010), will exploit others for personal benefit (Campbell, Hoffman, Campbell, & Marchisio, 2011), are callous and unapologetic (Leunissen, Sedikides, & Wildschut, 2017) and are low on agreeableness, empathy, shame, and guilt (Hepper, Hart, Meek, Cisek, & Sedikides, 2014). Vulnerable (covert) narcissists are similarly characterised by feelings of grandiosity and a belief that they are special yet feel intense shame about their needs and ambitions (Pincus & Roche, 2011). Traits of covert narcissism are associated with introversion, anxiety, and defensiveness (Miller et al., 2017).

In line with the Skedikides, Ntoumanis, and Sheldon (2019) we posit that narcissistic personality traits warrant greater examination, especially from the SDT community. Specifically, we propose three factors that make narcissism an important candidate for further analysis. First, narcissistic traits involve distorted cognition and beliefs about the self and others, feasibly altering both individuals' perception of and response to their environment (e.g., response to social rejection and negative feedback; Cascio, Konrath, & Falk, 2015; Matsuo & DeSouza, 2016). Cascio et al.'s work in particular seems to support a perceptual mechanism, as narcissists showed hypersensitivity in brain regions associated with distress during social exclusion (i.e., the experience was perceived as more painful). Second, the development of narcissistic traits is thought to be attributable to inappropriate parenting and societal pressures (Horton, 2011; Twenge & Campbell, 2009). From a SDT perspective, this can be conceptualised as impairments in the degree to which needs are met during important developmental years, as such, narcissistic traits might serve as a façade (compensatory behaviour) that conceals underlying feelings of inferiority, low self-esteem, and need frustration. Needs then may be devalued in favour of compensatory satisfaction. Third, the

number of individuals with narcissistic traits is increasing, potentially due to sociocultural changes (Cai, Kwan, & Sedikides, 2012; Twenge & Foster, 2010; Santos, Varnum, & Grossman, 2017), making further exploration of its emergence and effects of great interest.

1.5 Summary and research questions

The main aim of the present research was to examine whether sensitivity to and responses to need supportive and thwarting events varied as a function of personality. To test a sensitivity mechanism, we hypothesised direct associations between personality dimensions and reported need satisfaction and frustration (following exposure to a standardised event). Specifically, that:

1. Need satisfaction would be significantly predicted by openness and extraversion (positively) and neuroticism and covert narcissism (negatively). Both openness (i.e., curiosity, inventiveness, creativity, feelings perceived as important) and extraversion (outgoing, energetic, social, and seeks the company of others) were expected to enhance sensitivity to recognising positive experiences. Neuroticism (sensitive, nervous, experience unpleasant emotions easily) and covert narcissism (grandiose fantasies and a sense of entitlement, yet shy, vulnerable to stress, and lack empathy) were expected to reduce sensitivity to recognising positive experiences.
2. Conversely, need frustration would be significantly predicted by neuroticism and covert narcissism (positively) and agreeableness (negatively). Neuroticism and covert narcissism were anticipated to exacerbate sensitivity to recognising negative experiences, whereas agreeableness (friendliness, compassion, cooperation) would reduce the perceived thwarting nature of situations.

To test a behavioural mechanism, we proposed that personality would influence planning of need seeking or need avoiding behaviour, over and above the influence of felt need satisfaction and need frustration. Specifically, that:

3. Conscientiousness (efficient, organised, dependable, achievement focused), overt narcissism (require attention/admiration, grandiose fantasies, enjoy opportunities for self enhancement), and openness would enhance reactions, and neuroticism and covert narcissism would undermine reactions, to need frustration and satisfaction. Specifically, conscientiousness, overt narcissism, and openness would predict greater need seeking and reduced need avoidance, whereas neuroticism and covert narcissism would predict the opposite (i.e., decreased need seeking and increased need avoidance).

Finally, we ran exploratory moderation-based analyses to determine the extent to which the influence of personality was consistent across changing levels of need frustration or satisfaction. Belsky's differential susceptibility hypothesis (1997) would imply that the impact of personality traits would be consistent whether environments are challenging (thwarting) or supportive. In contrast, if traits present as a vulnerability to stress only (Zuckermann, 1999), the strongest effects should be observed under the most unfavourable conditions. We aligned ourselves with Belsky's perspective, hypothesising no moderated interactions would emerge.

Given the novelty of the propositions, the hypotheses were tested then replicated across two different samples. Study one recruited undergraduate university students, whilst study two sampled retired older adults. Undergraduate students and retiring adults were chosen as both transition points require adaptation to new stimuli and contexts, and feature shifts in sources of need satisfaction. However, there are important differences in mean trait levels by age (Roberts, Walton, & Viechtbauer, 2006), and older adults have greater life experience which might be associated with the development of more effective emotion regulation strategies and coping mechanisms with life stresses (Helson & Soto, 2005; Labouvie-Vief, Diehl, Jain, &

Zhang, 2007). Examining findings across these two samples then provides some confidence in the replicability of results, and their applicability of our conceptual model across the life span.

Methods

Participants. Sample one recruited one hundred and seventy-seven undergraduate students (*M*age = 19.73, SD = 1.98; Male = 109). Inclusion criteria required participants to be aged 18 and over and fluent in written and spoken English. All students were enrolled on a on the same degree programme at the same university. Students were recruited through a first-year sport and exercise psychology module. No course credit was received for engaging in the research. Sample two recruited one hundred and seventeen retired older adults (*M*age = 66.28, SD = 6.15; Male = 49). Inclusion criteria required participants to be aged 18 and over, fluent in written and spoken English, and retired from employment. Participants were recruited through diverse sampling approaches (e.g., social media, word of mouth and communication with third-sector organisations working with older adults). Two participants from sample two omitted vignette responses and were removed from analysis. Informed consent was obtained from all participants.

Procedure. Data collection involved quantitative data in the form of self-report personality data (see below for details) and responses to six SDT-informed vignette scenarios. The self-report personality measure and vignettes were presented to participants in a counter-balanced order in both studies; group A (student sample n = 94, older adult sample n = 62) completed personality measures followed by vignettes, whilst group B (student sample n = 83, older adult sample n = 55) completed vignettes followed by personality measures. In sample one, all participants completed the research electronically, however to support disability inclusion, one participant requested to complete the research using paper-based materials. In sample two, participants had a choice to complete the study online (n = 105) or via hard-copy received by

post (n = 12).

Task. The principal and co-authors developed six SDT-informed vignettes, which were reviewed by SDT-focused researchers. Each vignette systematically described a need supportive or thwarting experience in an academic context (sample one) or a retirement context (sample two) to ensure relevancy to the sample. Participants responded to each vignette on a 1 (*Not at all*) to 5 (*Very strongly*) Likert-scale regarding their felt need satisfaction (e.g., cared for by the lecturer/cared for by friends and family [need satisfaction], feeling inadequate as a student/incapable [need frustration]) and subsequent planned need orientated behaviour (e.g., find ways to learn new material/find ways to do what truly interests me [need seeking], avoid contact with others/want to be alone; I wouldn't want to be with others [need avoidance]). For concision, we refer to this as planned need avoidance or planned need seeking from here on.

Response items were adapted from existing measures for application to the vignette, specifically: Balanced Measure of Psychological Needs-General (Sheldon & Hilpert, 2012), Basic Psychological Needs Scale-General (Deci & Ryan, 2000), and Psychological Need Thwarting Scale (Bartholomew, Ntounmanis, Ryan, & Thogersen-Ntoumani, 2011). Vignettes and response items were critiqued by three experts (including an author of SDT-based publications, and two educators/practitioners) for their clarity, fit with SDT concepts, and appropriateness for the task context.

Task and Vignette Examples. Participants were asked to read brief hypothetical situations, and for each, respond to twelve questions about how they would feel or behave in that situation. Reponses were a 7-item scale from 1 (*I would not at all feel this way*) to 7 (*I would very strongly feel this way*). An example vignette for both the student and older adults sample follows (others are available on request from the corresponding author):

Sample one example vignette. You attend a seminar in which your lecturer sets out the task as follows: "In today's session I would like you to design an intervention to help

an athlete perform at an upcoming competition. You can choose the athlete, their sport, and how best to intervene. This will help develop your understanding of the concepts we have covered during this module. There are no right or wrong answers to this problem, so be creative in your approach and use any of the resources that you have available to you.". This lecturer always provides you with a detailed rationale for the task set, offers opportunity for you to engage with them and your fellow students about the task, and welcomes your opinions/questions.

Sample two example vignette. Having recently retired you are enjoying having more free time - your life no longer revolves around your work schedule. You take advantage of your new freedom by doing things that are of interest to you, such as going for walks, volunteering, meeting up with friends, and gardening. You consider taking up a new hobby and are impressed by the variety of clubs available in the local area. You tried some of them out without any commitment to join. You realise that since retiring you get to choose how to spend your time and can do what you truly enjoy.

Measures.

Big Five Inventory-10 (BFI-10; Rammstedt & John, 2007) is a 10-item short form of the Big Five Inventory (John, Donahue, & Kentle, 1991) assessing extraversion, agreeableness, conscientiousness, neuroticism and openness. Participants responded to the stem "I see myself as someone who…" on a 1 (*Disagree Strongly*) to 5 (*Agree Strongly*) Likert-scale. In sample one, an additional agreeableness item ("is considerate and kind to almost everyone") was included to improve the inventory's validity and reliability (see Rammstedt & John, 2007). With the additional agreeableness item the BFI-10 demonstrates a large positive correlation with the full BFI (r = .83), predicted almost 70% of the variance of the full scale, and demonstrated acceptable test-retest correlations (r = .72). Due to an administration error this additional item was not used in sample two, however the scale still demonstrates acceptable

correlations with the full BFI (r = .74) and a comparable test-retest correlation (r = .68; Rammstedt & John, 2007).

Narcissistic Personality Inventory-16 (NPI-16; Ames, Rose, & Anderson, 2006) is a short form of the Narcissistic Personality Inventory (Raskin & Terry, 1988), a measure of subclinical overt narcissism. The NPI-16 uses a forced-choice format with a narcissistic and non-narcissistic response for each item (e.g., "I am apt to show off if I get the chance" and "I try not to be a show off"). The NPI-16 demonstrates acceptable internal consistency (alpha = .72) and a large positive correlation with the full scale (r = .90).

Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997) is a 10-item measure of hypersensitive narcissism (covert narcissism; e.g., "I am secretly 'put out' or annoyed when other people come to me with their troubles, asking me for my time and sympathy"). Participants responded to each item on a 1 (*Very uncharacteristic or untrue, strongly disagree*) to 5 (*Very characteristic or true, strongly agree*) Likert scale. The HSNS has evidenced adequate internal consistency reliability in adult, nonclinical samples (alpha > .70; Hendin & Cheek, 1997; Fossati, Borroni, Grazioli, & Cheek, 2009).

Analysis

For both samples, multiple linear regressions were used to explore associations between personality dimensions and need satisfaction and frustration. Moderated hierarchical regression analyses were then used to test whether personality dimensions moderated the effects of need satisfaction and frustration on planned need avoidance or need seeking. This was conducted in the manner recommended by Jaccard, Turisi, and Wan (1990); all independent variables were standardised and centred prior to computing the product terms. Jaccard et al. (1990) recommend that variables are standardised in order that they possess common metric, making it easier to form conclusions regarding the magnitude of the

coefficients for different independent variables. All hypotheses were tested against a significance level of $p \leq 0.05$.

Post hoc power analyses were conducted for each regression analysis using the recruited sample size for each study (N = 177, N = 117) and achieved effect sizes, and alpha levels, are reported below. When separate models were run for satisfaction and frustration, and seeking and avoidance, the post hoc analyses revealed adequate statistical power (power always exceeded .98). One exception to this was the power achieved for sample two (retirees) on hypothesis two (.71).

Results

Descriptives summary: Means, standard deviations, and Pearson's correlations are presented in Table 1 and 2 (student sample and older adults sample, respectively). At the bivariate level, strong significant correlations were observed between the big five personality dimensions and need satisfaction, with the exception of openness. Only extraversion and neuroticism were related to need frustration. The narcissism dimensions were related to both satisfaction and frustration in the manner hypothesised. With respect to planned behaviours, need satisfaction was strongly associated with greater need seeking and less need avoidance, with the reverse pattern observed for need frustration (i.e., greater need avoidance, and less need seeking), as would be predicted by SDT.

One notable difference between the two samples is the difference in significant correlations between sample one and 2 with respect to overt narcissism and need satisfaction and need frustration. Specifically, the student sample revealed large significant correlations between overt narcissism and need satisfaction (r = .275, p = .010) and need frustration (r = -.191, p = .019), whilst nonsignificant relationships were evidenced in the older adults' sample (need satisfaction; r = .161, p = .087 and need frustration; r = -.014, p = .882). While these

direct relationships were not the focus of the present study, this is a finding worth further exploration in future work. Here, we tentatively posit that this difference could be attributable to older adults having greater life experience which might be associated with the development of more effective emotion regulation strategies (Helson & Soto, 2005; Labouvie-Vief, Diehl, Jain, & Zhang, 2007).

INSERT TABLE 1 HERE

INSERT TABLE 2 HERE

Hypothesis one: Need satisfaction would be significantly predicted by openness and extraversion (positively) and neuroticism and covert narcissism (negatively).

Analysis: Linear regression was performed with need satisfaction as the dependent variable and personality traits entered in one step as independent variables.

Study one. Need satisfaction was significantly predicted by the model ($F_{(4,\ 149)}$ = 8.884, $p < .001$, $R^2 = .139$). As hypothesised, extraversion ($t_{(149)} = 2.685$, $p = .008$) positively predicted need satisfaction, whereas covert narcissism ($t_{(149)} = -2.881$, $p = .005$), and neuroticism ($t_{(149)} = -2.076$, $p = .040$) negatively predicted need satisfaction. Contrary to our hypothesis, openness was unrelated to need satisfaction ($t_{(149)} = -.394$, $p = .694$).

Study two. Need satisfaction was significantly predicted by the model ($F_{(4,\ 107)}$ = 9.223, $p < .001$, $R^2 = .256$). As hypothesised, extraversion ($t_{(107)} = 4.716$, $p < .001$) positively predicted need satisfaction. Contrary to our hypothesis, covert narcissism ($t_{(107)} = -1.490$, $p = .139$), neuroticism ($t_{(107)} = -.667$, $p = .506$) and openness were unrelated to need satisfaction ($t_{(107)} = -.677$, $p = .500$).

Hypothesis two: Need frustration would be significantly predicted by neuroticism and covert narcissism (positively), and agreeableness and extraversion (negatively).

Analysis: Linear regression was performed with need frustration as the dependent variable and personality traits entered in one step as independent variables.

Study one. Need frustration was significantly predicted by the model ($F_{(4,\ 146)}$ = 10.979, $p < .001$, $R^2 = .231$). As hypothesised, both covert narcissism ($t_{(144)} = 2.977$, $p = .003$) and neuroticism ($t_{(144)} = 2.817$, $p = .006$) were positive predictors, whilst extraversion was a negative predictor ($t_{(144)} = -2.738$, $p = .007$). Contrary to our hypothesis, agreeableness did not predict need frustration ($t_{(144)} = 1.420$, $p = .527$).

Study two. Need frustration was significantly predicted by the model ($F_{(4,\ 108)}$ = 6.681, $p = .000$, $R^2 = .198$). As hypothesised, covert narcissism was a negative predictor ($t_{(108)}$ = 2.152, $p = .034$), and extraversion was a positive predictor ($t_{(108)} = -3.575$, $p = .001$). Contrary to our hypothesis, neuroticism ($t_{(108)} = -.082$, $p = .935$) and agreeableness ($t_{(108)} = -.792$, p = .430) did not predict need frustration.

Hypothesis three: Personality would explain significant variance in need seeking and need avoiding behaviours over and above the effects of satisfaction and frustration

Analysis: Linear regression was performed with need seeking/need avoiding as the dependent variable, independent variables included need seeking and need frustration (block 1), followed by personality traits (block 2).

Study one. Need seeking was significantly predicted by the model ($F_{(9,\ 124)} = 9.094$, $p <$ .001, $R^2 = .416$ Personality traits added significant additional variance over and above that

explained by need satisfaction and frustration (Δr^2 = .088; p = .021). Extraversion ($t_{(124)}$ = 2.765, p = .007) and conscientiousness ($t_{(124)}$ = 2.533, p = .013) were significant predictors.

Need avoidance was significantly predicted by the model ($F_{(9, 119)}$ = 15.613, p < .001, R^2 = .561). Personality traits added significant additional variance over and above that explained by need satisfaction and frustration (Δr^2 = .074; p = .014). Extraversion ($t_{(119)}$ = -2.047, p = .043) was a significant predictor.

Study two. Need seeking was significantly predicted by the model ($F_{(9\ 102)}$ = 12.187, p < .001, R^2 = .518). However, personality traits did not add significant additional variance over and above that explained by need satisfaction and frustration (Δr^2 = .050; p = .175).

Need avoidance was significantly predicted by the model ($F_{(9, 101)}$ = 14.452, p < .001, R^2 = .563). Personality traits added significant additional variance over and above that explained by need satisfaction and frustration (Δr^2 = .079; p = .016). However, no personality traits were significant predictors.

Exploratory analysis: Moderated hierarchical regressions were conducted with need satisfaction or frustration entered as independent variables and the relevant personality dimensions as moderators. Outcomes were planned need seeking and need avoidance.

Study one. Of the 24 interactions tested, four were significant (see Table 3); standardised beta coefficients are presented. Significant interactions with need frustration emerged for extraversion and covert narcissism on need seeking (Δr^2 = .083, ΔF = 5.411, $p\Delta_F$ = .001; Δr^2 = .051, ΔF = 3.047, $p\Delta_F$ = .004, respectively), whilst a significant interaction with need frustration emerged for neuroticism on need avoidance (Δr^2 = .020, ΔF = 3.047, $p\Delta_F$ = .004). The only significant interaction with need satisfaction was neuroticism on need seeking (Δr^2 = .032, ΔF = 7.099, $p\Delta_F$ = .009).

INSERT TABLE 3 HERE

Study two. Of the 24 interactions tested, six were significant (see Table 4); standardised beta coefficients are presented. Significant interactions with need frustration emerged for covert narcissism and neuroticism on need seeking ($\Delta r^2 = .109$, $\Delta F = 15.292$, $p\Delta_F < .001$; $\Delta r^2 = .070$, $\Delta F = 9.010$, $p\Delta_F = .003$, respectively), no significant interactions with need frustration on need avoidance emerged. Significant interactions with need satisfaction emerged for conscientiousness, extraversion, covert narcissism and neuroticism on need seeking ($\Delta r^2 = .027$, $\Delta F = 5.888$, $p\Delta_F = .017$; $\Delta r^2 = .039$, $\Delta F = 8.559$, $p\Delta_F = .004$; $\Delta r^2 = .045$, $\Delta F = 10.025$, $p\Delta_F = .002$; $\Delta r^2 = .045$, $\Delta F = 9.977$, $p\Delta_F = .002$, respectively).

INSERT TABLE 4 HERE

In order to assess the nature of these interactions graphs were plotted (see *Figure 1 as an example of the interactions observed)* using the regression estimation equation formed from the unstandardised coefficients, in the manner recommended by Jaccard et al. (1990). Plot points are calculated for hypothetical participants scoring one standard deviation above and below the mean, (labelled high and low respectively), on each of the predictor variables (Cohen & Cohen,1983). Interaction simple slopes of the regression lines were computed to identify whether the slopes differed significantly from zero.

INSERT FIGURE 1 HERE

Simple slope analyses identified that on the whole regression lines at both high and low levels of moderators significantly differed from zero (range of $t = -2.698$ to 8.999*;* range of *p*

= <.001 to .038*)*. Exceptions include the regression line for: i) need frustration and extraversion on need seeking when extraversion was low in study one (p = .258), ii) need frustration and neuroticism on need seeking when neuroticism was low in study two (p = .063), and iii) need frustration and covert narcissism on need seeking when covert narcissism was low in study two (p = .450). There was consistency in the form of observed interactions. Specifically, the least healthy outcomes (i.e., lowest need seeking) were predicted by low satisfaction or high frustration *combined with* high neuroticism, high covert narcissism, low extraversion, and low conscientiousness.

4. Discussion

4.1 Overview

The main aim of the present research was to examine whether sensitivity to and responses to need supportive and thwarting events varied as a function of personality. A sensitivity and a reactiveness pathway were tested. Both samples provided support for the first pathway whereby personality alters individuals' sensitivity an environmental stimulus, predicting resultant satisfaction and frustration. Covert narcissism and neuroticism increase sensitivity to feeling frustration, and decrease sensitivity to feeling satisfaction. Extraversion increased sensitivity to feeling need satisfaction. There was less evidence supporting the second pathway, by which personality alters the individual's response to experienced satisfaction or frustration in the form of more or less adaptive response planning. While some significant interactions indicated personality traits influence outcomes more strongly in unfavorable environments, the majority of interactions were nonsignificant.

4.2 Main findings

Direct associations between personality dimensions, and felt need satisfaction or frustration suggest that some personality traits affect the likelihood of interpreting an environment as supportive or thwarting. As hypothesised, extraversion was positively associated with need satisfaction, whilst covert narcissism and neuroticism were positively associated need frustration, and negatively with need satisfaction. While clearly not all traits influence sensitivity to the level of need support or thwarting provided by the social environment, initial evidence supporting personality dimensions altering the functional significance of an event is therefore provided (Deci & Ryan, 1987; Soenens et al., 2015). Of interest, agreeableness did not seem to serve a protective function as has been seen previously (i.e., Jessen-Campbell, Gleeson, Adams, & Malcolm, 2003). It is possible that context is important here – in study one the more distal relationship between a lecturer and student, relative to parent and child, may make concessions to another's perspective less likely.

The direct associations between the level of reported need satisfaction/frustration and future planned behaviour are somewhat consistent with SDT. The level of felt need satisfaction was strongly associated with greater need seeking and less need avoidance behaviours, with the reverse pattern observed for need frustration (i.e., greater need avoidance, and less need seeking). The potential harmful decision to engage in less need seeking behaviours in response to felt need thwarting contrasts with SDT's proposition that people should be motived to satisfy deprived needs, that when need frustration is experienced, individuals should turn their attention to less satisfied needs (Deci & Ryan, 2000). Actively avoiding opportunities to satisfy deprived needs might hinder one's ability to achieve balanced need satisfaction (Sheldon & Niemiec, 2006), and result in similar negative outcomes as the maladaptive behaviours discussed in SDT (e.g., need substitutes, non-optimal regulatory styles, and rigid behaviour patterns; Deci, 1980).

On the whole, personality did not add to variance in response planning over and above

that explained by felt satisfaction or frustration. This suggests that variation in personality traits does not alter how individuals plan to act after experiencing need satisfaction or frustration, supporting universal positive and negative outcomes of satisfaction and frustration, respectively, as proposed by SDT (Deci & Ryan, 2000). As such, it appears that personality predominantly acts through influencing the degree of satisfaction or frustration arising from a thwarting or supportive experience, that is, through altering the functional significance of the event to the individual (Deci & Ryan, 1987).

There were few significant interactions suggesting that personality effects become stronger in unfavorable conditions, however, five reasons suggest that these are not merely statistical artifacts and are worthy of further discussion. First, there is consistency in the pattern of interaction across different personality traits and outcomes – personality exacerbates responses when support was low or frustration high. Second, the nature of these interactions is consistent with our hypothesis, that is, the poorest outcomes (least need seeking and highest need avoidance) occurred at low satisfaction or high frustration *combined with* high neuroticism, high covert narcissism, and low overt narcissism, whereas better outcomes were predicted when these negative traits were low. Third, interaction forms were broadly replicated across the two samples. Fourth, researchers have reported considerable difficulty in finding theorised moderator effects (McClelland & Judd, 1993), such that even those explaining as little as 1% of additional variance might be considered meaningful (Evans, 1985). Lastly, there are commonalities between those variables that emerged as significant moderators, and those that did not.

With respect to this final point, significant interactions occurred for personality traits associated with negative outcomes. Specifically, neuroticism presents a dispositional vulnerability to a range of psychopathological concerns including anxiety, mood, and somatic disorders (Widiger & Oltmanns, 2017), as well physical health and frequency of health service

use (Lahey, 2009). Narcissism is related to significant psychosocial distress, physical comorbidities and social problems (Kacel, Ennis, & Pereitra, 2017). High levels of these traits exacerbated negative responses under challenging conditions; low levels predicted more adaptive responses under challenging conditions. This contrasts with Sedikides, Ntoumanis, and Sheldon's (2019) theorisation that need deficits would cause individuals with traits of neuroticism and covert narcissism to engage in need satisfying efforts. Instead, the 'double negative' effect of an environmental and an individual difference variable was similar to that previously observed in interactions between controlling environments and negative self-talk (Oliver, Markland, & Hardy, 2010). Further, if neuroticism or narcissism have a developmental component, whereby they are reinforced by need thwarting experiences (Horton, 2011), then the observed associations are of interest to Moller et al.'s (2010) desensitization hypothesis: these traits predict more, not less, sensitivity to experiencing frustration, but also seem to predict subsequent devaluing of its acquisition in response planning. Support is also provided for the ideas of a differential susceptibility to environmental conditions – both in terms of a vulnerability to negative environmental stimuli (e.g., Zuckerman, 1999), but also a differential ability to plan adaptive behaviour in non-optimal environments.

It is important to note that significant interactions were primarily observed for need seeking behaviours (9 out of the 10 significant interactions evidenced). Whilst further exploration of this is needed, we posit that this may be because variance in need avoidance was insufficient to demonstrate interactive effects. Need avoidance would be conceptualised as a later stage form of resistance (similar to exhaustion) in Radel et al's (2011) temporal need threat model. In the present study, we suggest that one-off exposure to a hypothetical vignette was not potent enough to warrant participants responding with high levels of need avoidance (see Table 1). Instead, a less harmful reduction in need seeking behaviour is demonstrated. Similar to Neubauer, Voss, and Ditzen, (2018) we posit that a cumulative effect of frustration

might evoke greater variance in need avoidance response, and subsequently, an observable influence of personality on said response.

4.3 Narcissism-related findings

One of the strengths of the present research was that it broadened our analysis of personality within SDT beyond the 'big five' by including overt and covert narcissism. The distorted cognitions and beliefs associated with narcissism seem to alter interpretation of the environment (being need satisfying or need frustrating) and subsequent response planning. In line with previous literature, overt narcissists reap some benefits from their grandiose, inflated view of the self (e.g., self-esteem, Brookes, 2014; Watson, Little, Sawrie & Biderman, 1992; Watson, Hickerman, & Morris, 1996; optimism, Hickman et al., 1996; and happiness, Rose, 2002), specifically reporting higher levels of need satisfaction in the environment and more need seeking subsequent behaviours. In contrast, covert narcissists forgo the benefits of the narcissistic trait due to their insecurities/vulnerability (Atlas & Them, 2008; Miller, Dir, Gentile, Wilson, Pryor, & Campbell, 2010). In the present research, this was evidenced through reporting higher levels of need frustration and more need avoidance behaviours. As such, the differences in environmental interpretation and subsequent behavioural choices between overt and covert narcissists, not just the differences in self-esteem (Zhang, Luo, Zhao, Zhang, & Wang, 2017) might explain the polarity in psychological outcomes experienced,

In sum, the present research provides evidence supporting personality altering the sensitivity of the individual to experiencing satisfaction or frustration within their social environment. In addition, the data support the proposition that the magnitude of response varies between individuals, with more non-favorable personality traits exacerbating responses to unfavorable conditions.

4.4 Limitations and Future Research

It is worth noting several limitations of the research. The research is cross sectional in design, as such cause and effect cannot be determined. Whilst the vignette methodology allowed for a 'snapshot' of a systematic, controlled need supportive/thwarting environment, the methodology lacks construct and external validity (Evans et al., 2015). Participants can be detached from the situation, neglecting interaction and feedback that is associated with 'real life'. As such, examining actual exposure to different contextual circumstances will be an important extension of the current work.

In addition, the exploratory analysis performed separate moderated hierarchical regressions with either need satisfaction or frustration entered as an independent variable, as such the analysis does not account for the environment's ability to, theoretically, simultaneously provide some degree of need satisfaction and need thwarting. This decision was taken to avoid overfitting the regression model with numerous predictor variables which can be associated with a poorly predicting model. Future work with larger samples may wish to model environmental factors simultaneously. Future research should additionally use validated techniques to create need supportive and thwarting environments in a controlled laboratory experiment (e.g., Deci, Eghrari, Patrick & Leone, 1994; Thomas, Hudson, & Oliver, 2019; Sheldon & Filak, 2008) before extending these propositions to more natural, longitudinal assessments. This progression should assess actual rather than intended behavioural data, monitor how personality might alter responses to unfavourable environments over time (enabling exploration of how personality influences equifinality), and in turn how these processes impact on wellbeing.

4.5 Implications

With respect to implications of the current work, the somewhat deterministic relationship between satisfaction and adaptive planned responses, and frustration and maladaptive planned responses, is concerning. If satisfaction leads to greater engagement with environments and activities likely to provide further satisfaction (e.g., activities that one is competent in, seeking time with significant others), this supports SDT's organismic and growth-oriented perspective on human behaviour – that is, individuals do not seek satisfaction but have a drive to seek out new experiences if conditions are satisfying. It also undermines arguments that need satiation might occur in highly-satisfying environments. Conversely, if frustration results in maladaptive responses (e.g., disengaging from company, resigning to doing as one is told and engaging with minimal effort, avoidance), this is only likely to exacerbate the negative outcomes of frustration. Future research should consider developing techniques to identify and help alter the negative cognitive styles associated with neuroticism and narcissism, in particular the promotion of need satisfying choices. This might be embedded with counselling techniques such as cognitive behavioral therapy (Cristea, Tatar, Nagy, & David, 2012).

In relation to the two diverse samples examined in the present research, important implications include an awareness of the variability in individuals' experiences. This is particularly pertinent for understanding and supporting student health, for example, for welfare-screening for those students at greater risk of experiencing mental health issues or who are less likely to seek support. Through more targeted student support strategies we might be able to better support the most vulnerable students, preventing drops in their mental health or drop out from university, a pertinent issue in UK universities (Brown, 2016; Unite, 2016). Similarly, the diversity in experience is one mechanism explaining the variability in retirement experiences, particularly concerning well-being, loneliness and isolation (Bauger & Bongaardt, 2016; Wang, 2007). Future work could explore the potential to design and implement

interventions tailored to providing need seeking experiences in retirement for those most at risk at becoming isolated when exiting employment.

4.6 Conclusion

To conclude, the present research tests the ideas of self-determination theory to extend our understanding of the role that individual differences play within social contexts. The data support arguments that the magnitude of response to need supportive and need thwarting environments might depend on personality differences (Mabbe et al., 2016), and extends this assertion by also considering how personality shapes reactions to need satisfaction and frustration through subsequent behavioural choices. Traits of neuroticism and covert narcissism are most vulnerable to the 'double negative' effect of greater sensitivity to need thwarting and increased likelihood of orientating towards subsequent need avoidance behaviours. Replicating and extending these findings using actual rather than intended behaviour, and monitoring how personality might alter responses to unfavorable environments over time is recommended. From an applied perspective, developing techniques to support perceptions of need satisfaction in the environment and need seeking behaviours would be an important development to enhance psychological health for individuals with more 'vulnerable' personality traits.

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Table 1.

Sample 1 Means, SDs and intercorrelations among the variables.

	Mean	SD	NS	NF	E	A	C	N	O	ON	CN	NS
NSu	82.85	10.27	-									
NF	60.22	12.52	-.421**	-								
E	7.11	1.90	.300**	-.298**	-							
A	7.19	1.74	.223**	-.000	.211**	-						
C	7.12	1.67	.290**	-.052	.042	.022	-					
N	6.40	1.88	-.291**	.373**	-.219**	.030	-.117	-				
O	6.58	1.52	-.010	-.115	.233**	.029	.066	.160*	-			
ON	3.06	2.94	.275**	-.191*	.244**	-.250**	.143	-.301**	.073	-		
CN	27.58	5.56	-.328**	.305**	-.221**	-.293**	-.088	.377**	-.026	.108	-	
NSe	92.27	12.50	.569**	-.273**	.307**	.140	.326**	-.217**	.028	.257**	-.173*	-
NA	61.38	10.86	-.468**	.646**	-.393**	-.106	-.140	.319**	-.178*	-.176*	.328**	-.403**

NSu Need satisfaction; NF Need frustration; E Extraversion; A Agreeableness; C Conscientiousness N Neuroticism; O Openness; ON Overt narcissism; CN Covert narcissism; NSe Need seeking; NA Need avoidance. Means and SD's are across all vignettes. * = $p < .05$, ** = $p < .001$

Table 2.

Sample 2 Means, SDs and intercorrelations among the variables.

	Mean	SD	NS	NF	E	A	C	N	O	ON	CN	NS
NSu	93.36	10.11	-									
NF	46.26	14.90	-.470**	-								
E	6.93	2.19	.471**	-.383**	-							
A	7.37	1.88	.193*	-.142	.090	-						
C	8.17	1.79	.290**	-.235*	.144	.269**	-					
N	4.97	1.99	-.273**	.155	-.357**	-.079	-.112	-				
O	7.2	1.79	-.046	-.012	.057	.006	.011	.125	-			
ON	3.03	2.73	.161	-.014	.264**	-.208*	.279**	-.274**	-.041	-		
CN	25.26	6.11	-.249*	.297**	-.228**	-.278**	-.217*	.305**	-.003	.071	-	
NSe	102.53	13.64	.678**	-.227*	.326**	.273**	.268**	-.181	.029	.062	-.293**	-
NA	49.17	15.55	-.445**	.695**	-.415**	-.273*	-.326**	.099	-.030	-.111	.342**	-.516**

NSu Need satisfaction; NF Need frustration; E Extraversion; A Agreeableness; C Conscientiousness N Neuroticism; O Openness; ON Overt narcissism; CN Covert narcissism; NSe Need seeking; NA Need avoidance. Means and SD's are across all vignettes. * = $p < .05$, ** = $p < .001$.

Table 3: Sample 1 hypothesised interactions between need satisfaction and frustration, and personality, on need seeking and avoiding behaviour.

DV:	Independent Variable:	R^2:	ΔR^2 :	*p*(F):	β:	*p*(β):
Need seeking	Need satisfaction	.324	.324	.000	.506*	.000
	Conscientiousness	.358	.034*	.007	.187*	.009
	Product	.366	.008	.186	-.095	.186
Need avoiding	Need satisfaction	.219	.219*	.000	-.455*	.000
	Conscientiousness	.227	.008	.222	-.102	.223
	Product	.227	.000	.954	-.005	.954
Need seeking	Need frustration	.074	.074*	.001	-.266*	.001
	Conscientiousness	.165	.091*	.000	.299*	.000
	Product	.183	.018	.078	.147	.078
Need avoiding	Need frustration	.417	.417*	.000	.648*	.000
	Conscientiousness	.430	.013	.080	-.118	.087
	Product	.443	.013	.080	-.129	.080
Need seeking	**Need satisfaction**	**.324**	**.324***	**.000**	**.527***	**.000**
	Neuroticism	**.329**	**.004**	**.335**	**-.087**	**.226**
	Product	**.360**	**.032***	**.009**	**.176***	**.009**
Need avoiding	Need satisfaction	.219	.219*	.000	-.415*	.000
	Neuroticism	.246	.027*	.028	.184*	.019
	Product	.258	.012	.135	-.111	.135
Need seeking	Need frustration	.066	.066*	.002	-.206*	.019
	Neuroticism	.093	.026*	.045	-.160	.067
	Product	.113	.020	.076	.144	.076
Need avoiding	**Need frustration**	**.427**	**.427***	**.000**	**.631***	**.000**
	Neuroticism	**.436**	**.009***	**.145**	**.094**	**.172**
	Product	**.455**	**.020***	**.029**	**.142***	**.029**
Need seeking	Need Satisfaction	.325	.325*	.000	.565*	.000
	Openness	.326	.001	.731	-.024	.737
	Product	.326	.000	.896	-.010	.896
Need avoiding	Need Satisfaction	.215	.215*	.000	-.471*	.000
	Openness	.251	.036*	.012	-.193*	.011
	Product	.254	.003	.488	.058	.488
Need seeking	Need Frustration	.068	.068*	.002	-.271*	.002
	Openness	.074	.006	.343	-.080	.348
	Product	.074	.000	.963	.004	.963
Need avoiding	Need Frustration	.421	.421*	.000	.630*	.000
	Openness	.444	.023*	.021	-.151*	.026
	Product	.444	.000	.744	-.024	.744
Need seeking	Need satisfaction	.330	.330*	.000	.542*	.000

	Overt narcissism	.342	.012	.123	.115	.124
	Product	.342	.000	.837	-.012	.837
Need avoiding	Need satisfaction	.214	.214*	.000	-.446*	.000
	Overt narcissism	.218	.004	.396	-.099	.218
	Product	.237	.019	.072	.129	.072
Need seeking	Need frustration	.075	.075*	.001	-.226*	.009
	Overt narcissism	.109	.034*	.025	.197*	.022
	Product	.114	.005	.382	.079	.382
Need avoiding	Need frustration	.408	.408*	.000	.636*	.000
	Overt narcissism	.409	.001	.646	-.027	.717
	Product	.410	.001	.633	.038	.633
Need seeking	Need satisfaction	.324	.324*	.000	.545*	.000
	Covert narcissism	.325	.000	.770	-.049	.516
	Product	.341	.017	.060	.123	.060
Need avoiding	Need satisfaction	.219	.219*	.000	-.385*	.000
	Covert narcissism	.278	.059*	.001	.269*	.001
	Product	.279	.002	.579	-.039	.579
Need seeking	**Need frustration**	**.074**	**.074***	**.001**	**-.231***	**.007**
	Covert narcissism	**.080**	**.005**	**.362**	**-.143**	**.114**
	Product	**.131**	**.051***	**.004**	**-.226***	**.004**
Need avoiding	Need frustration	.417	.417*	.000	.575*	.000
	Covert narcissism	.450	.033*	.005	.222*	.002
	Product	.455	.005	.276	.061	.276
Need seeking	Need satisfaction	.327	.327*	.000	.490*	.000
	Extraversion	.362	.035*	.006	.196*	.006
	Product	.365	.003	.383	-.051	.383
Need avoiding	Need satisfaction	.223	.223*	.000	-.357*	.000
	Extraversion	.290	.067*	.000	-.268*	.000
	Product	.307	.017	.073	.117	.073
Need seeking	**Need frustration**	**.065**	**.065***	**.002**	**-.093**	**.289**
	Extraversion	**.148**	**.083***	**.000**	**-.265***	**.001**
	Product	**.180**	**.032***	**.021**	**-.159***	**.021**
Need avoiding	Need frustration	.445	.445*	.000	.585*	.000
	Extraversion	.497	.052*	.000	-.238*	.000
	Product	.498	.486	.746	-.017	.746

* $p \leq .05$; significant interactions in bold.

Table 4: Sample 2 hypothesised interactions between need satisfaction and frustration, and personality, on need seeking and avoiding behaviour.

DV:	Independent Variable:	R^2:	ΔR^2 :	*p*(F):	β:	*p*(β):
Need seeking	**Need satisfaction**	**.459**	**.459**	**.000**	**.633***	**.000**
	Conscientiousness	**.467**	**.008**	**.220**	**.088**	**.216**
	Product	**.494**	**.027***	**.017**	**-.166**	**.017**
Need avoiding	Need satisfaction	.198	.198*	.000	-.374*	.000
	Conscientiousness	.231	.047*	.010	-.227*	.010
	Product	.225	.001	.689	.324	.689
Need seeking	Need frustration	.051	.051*	.015	-.163	.082
	Conscientiousness	.100	.049*	.015	.217*	.022
	Product	.106	.006	.382	.080	.382
Need avoiding	Need frustration	.483	.483*	.000	.667*	.000
	Conscientiousness	.511	.027*	.014	-.183	.009
	Product	.520	.009	.157	-.096	.157
Need seeking	**Need satisfaction**	**.459**	**.459***	**.000**	**.633***	**.000**
	Neuroticism	**.459**	**.000**	**.952**	**.024**	**.733**
	Product	**.504**	**.045***	**.002**	**.219***	**.002**
Need avoiding	Need satisfaction	.198	.198*	.000	-.431*	.000
	Neuroticism	.198	.001	.758	-.037	.675
	Product	.209	.011	.231	-.106	.231
Need seeking	**Need frustration**	**.051**	**.051***	**.015**	**-.167**	**.065**
	Neuroticism	**.073**	**.022**	**.109**	**-.138**	**.124**
	Product	**.143**	**.070***	**.003**	**-.267***	**.003**
Need avoiding	Need frustration	.483	.483*	.000	.695*	.000
	Neuroticism	.484	.000	.948	-005	.944
	Product	.484	.000	.886	.010	.886
Need seeking	Need Satisfaction	.459	.459*	.000	.668*	.000
	Openness	.464	.005	.325	.073	.302
	Product	.466	.002	.576	-.041	.576
Need avoiding	Need Satisfaction	.198	.198*	.000	-.459*	.000
	Openness	.198	.000	.930	.012*	.893
	Product	.200	.002	.588	-.049	.588
Need seeking	Need Frustration	.051	.051*	.015	-.236*	.015
	Openness	.052	.001	.774	.022	.816
	Product	.053	.001	.704	-.037	.704
Need avoiding	Need Frustration	.483	.483*	.000	.695*	.000
	Openness	.484	.001	.715	.025	.719
	Product	.484	.000	.994	.001	.994
Need seeking	Need satisfaction	.459	.459*	.000	.689*	.000

	Overt narcissism	.461	.001	.624	-.014	.851
	Product	.470	.009	.163	-.100	.163
Need avoiding	Need satisfaction	.198	.198*	.000	-.440*	.000
	Overt narcissism	.201	.003	.494	-.076	.392
	Product	.207	.006	.256	.081	.356
Need seeking	Need frustration	.051	.051*	.015	-.226*	.016
	Overt narcissism	.055	.004	.520	.065	.486
	Product	.060	.005	.428	.073	.428
Need avoiding	Need frustration	.483	.483*	.000	.692*	.000
	Overt narcissism	.491	.008	.196	-.090	.193
	Product	.491	.000	.817	-.016	.817
Need seeking	**Need satisfaction**	**.456**	**.456***	**.000**	**.540***	**.000**
	Covert narcissism	**.472**	**.463**	**.067**	**-.168**	**.018**
	Product	**.517**	**.045***	**.002**	**.234***	**.002**
Need avoiding	Need satisfaction	.230	.230*	.000	-.363*	.000
	Covert narcissism	.283	.053*	.006	.258*	.003
	Product	.297	.014	.150	-.130	.150
Need seeking	**Need frustration**	**.061**	**.061***	**.008**	**-.074**	**.423**
	Covert narcissism	**.114**	**.053***	**.012**	**-.323***	**.001**
	Product	**.223**	**.109***	**.000**	**-.348***	**.000**
Need avoiding	Need frustration	.469	.469*	.000	.615*	.000
	Covert narcissism	.488	.019*	.044	.166*	.027
	Product	.494	.006	.273	.080	.273
Need seeking	**Need satisfaction**	**.459**	**.459***	**.000**	**.649***	**.000**
	Ex	**.460**	**.001***	**.782**	**-.006**	**.933**
	Product	**.499**	**.039***	**.004**	**-.202**	**.004**
Need avoiding	Need satisfaction	.198	.198*	.000	-.309*	.001
	Ex	.258	.245*	.003	-.271*	.005
	Product	.261	.003	.508	.056	.508
Need seeking	Need frustration	.051	.051*	.015	-.089	.365
	Ex	.118	.067*	.004	.285*	.004
	Product	.138	.019	.119	.142	.019
Need avoiding	Need frustration	.483	.483*	.000	.627*	.000
	Ex	.506	.023*	.026	-.165*	.026
	Product	.506	.000	.865	-.012	.865

* $p \leq .05$; **significant interactions in bold.**

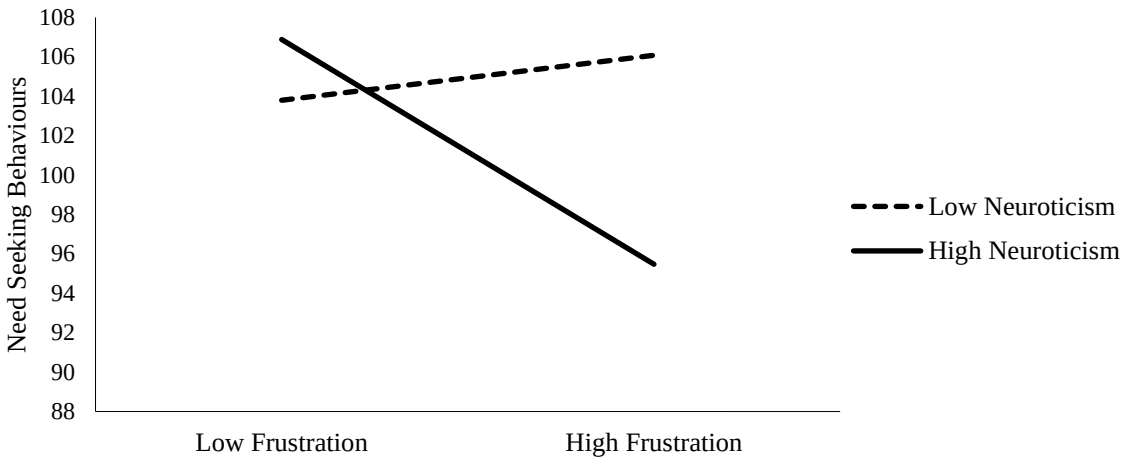

Figure 1: Interaction between neuroticism and level of need frustration on planned need seeking.